

All claims pending, including those unchanged by the present amendment, are reproduced below for the convenience of the Examiner. Please add new claims 55-60.

1 1. (Previously Amended) A method for separating an intact NP probe from a
2 phosphate detectable moiety, said method comprising:

3 a) providing a sample comprising an intact NP probe with a detectable moiety
4 attached thereto, whereupon an enzymatic cleavage of said intact NP probe to incorporate said
5 NP probe on a primer strand hybridized to a target nucleic acid, a phosphate detectable moiety is
6 produced, wherein said phosphate detectable moiety carries a molecular charge which is
7 different than the molecular charge of said intact NP probe; and

8 b) applying an energy field to said sample, thereby separating said phosphate
9 detectable moiety from said intact NP probe.

C1 1 2. (Original) The method according to claim 1, wherein said intact NP probe is a
2 charge-switch nucleotide phosphate probe having a detectable moiety on a terminal phosphate.

1 3. (Original) The method according to claim 2, wherein said charge-switch
2 nucleotide phosphate is a nucleotide triphosphate (NTP) having a γ -phosphate with a detectable
3 moiety attached thereto.

1 4. (Original) The method according to claim 3, wherein said γ -phosphate with a
2 detectable moiety attached thereto is a γ -phosphate with a fluorophore attached thereto.

1 5. (Original) The method according to claim 1, wherein said intact NP probe is
2 incorporated on a primer strand hybridized to a target nucleic acid using a polymerase, thereby
3 releasing said phosphate detectable moiety.

1 6. (Previously Amended) The method according to claim 5, wherein said
2 polymerase is immobilized.

1 7. (Original) The method according to claim 1, wherein said energy field is an
2 electric field.

1 8. (Original) The method according to claim 7, wherein said electric field is a
2 first electric field applied in a transverse direction and a second energy field is applied in an axial
3 direction.

1 9. (Original) The method according to claim 8, wherein said second energy field
2 applied in said axial direction is a pressure field.

1 10. (Original) The method according to claim 1, wherein the charge of said
2 phosphate detectable moiety is greater than said intact NP probe.

1 11. (Original) The method according to claim 1, wherein the charge of said
2 phosphate detectable moiety is less than said intact NP probe.

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2 12. (Original) The method according to claim 1, wherein the charge of said
2 phosphate detectable moiety is opposite in sign compared to said intact NP probe.

1 13. (Original) The method according to claim 1, further comprising c) detecting
2 said phosphate detectable moiety.

1 14. (Original) The method according to claim 13, wherein said detection is via a
2 charge coupled device (CCD) camera.

1 15. Previously Canceled.

1 16. (Original) The method according to claim 13, wherein said detection is via a
2 photodiode.

1 17. (Original) The method according to claim 13, wherein said detection is via a
2 blockade current.

1 18. (Previously Amended) A method for identifying an intact charge-switch
2 nucleotide phosphate (NP) probe, said method comprising:

3 a) contacting a sample comprising said intact charge-switch NP probe having a
4 charged moiety on the base, with an enzyme to produce a phosphate detectable moiety; and

5 b) applying an electric field to said sample, wherein said phosphate detectable
6 moiety migrates to an electrode differently than said intact charge-switch NP probe.

1 **19.** (Original) The method according to claim **18**, wherein said electrode is an
2 anode.

1 **20.** (Original) The method according to claim **18**, wherein said electrode is a
2 cathode.

1 **21.** (Original) The method according to claim **18**, wherein either said intact NP
2 probe has a positive molecular charge, or wherein upon cleavage of said phosphate detectable
3 moiety, said phosphate detectable moiety carries a positive charge relative to said intact NP
probe.

1 **22.** (Original) The method according to claim **18**, wherein said enzyme is
2 selected from the group consisting of a DNA polymerase, a DNA dependent RNA polymerase, a
3 reverse transcriptase, a phosphodiesterase and a phosphatase.

1 **23.** (Original) The method according to claim **18**, wherein said intact charge-
2 switch NP probe is a member selected from the group consisting of a nucleotide diphosphate, a
3 deoxynucleotide triphosphate (dNTP), and a nucleotide triphosphate (NTP).

1 **24.** (Original) The method according to claim **23**, wherein said deoxynucleotide
2 triphosphate (dNTP) is a member selected from the group consisting of deoxyadenosine
3 triphosphate, deoxycytosine triphosphate, deoxyguanosine triphosphate deoxythymidine
4 triphosphate and deoxyuridine triphosphate.

1 **25.** (Original) The method according to claim **18**, wherein said phosphate
2 detectable moiety is a pyrophosphate with a fluorophore moiety attached thereto.

1 **26.** (Original) The method according to claim **25**, wherein upon cleavage of said
2 pyrophosphate fluorophore moiety, said pyrophosphate fluorophore moiety carries a positive
3 charge relative to said intact NTP probe.

1 27. (Original) The method according to claim 18, wherein said intact NP probe
2 has a positive charge.

1 28. (Original) The method according to claim 18, wherein said intact NP probe
2 has a negative charge.

1 55. (New) A method for sequencing a nucleic acid, said method comprising:
2 providing a target nucleic acid, a polymerase priming moiety, a polymerase, and a
3 plurality of intact NP probes;
4 mixing said target nucleic acid, said polymerase priming moiety, said polymerase
5 and said plurality of NP probes under conditions permitting target dependent polymerization of
6 said plurality of NP probes, such conditions which are capable of providing a time sequence of a
7 plurality of phosphate detectable moieties; and
8 detecting over time said plurality of phosphate detectable moieties to provide a
9 sequence of said target nucleic acid.

1 56. (New) The method according to claim 55, wherein said primer moiety is a
2 hairpin loop.

1 57. (New) The method according to claim 55, wherein said plurality of
2 phosphate detectable moieties independently selected from the group consisting of PPI-Dye, a
3 terminal phosphate fluorophore moiety, a detectable moiety, charged groups, electrically active
4 groups, reporter groups, and combinations thereof.

1 58. (New) The method according to claim 55, wherein said phosphate
2 fluorophore moiety is a used for a member selected from the group consisting of one-color
3 sequencing, two-color sequencing, three-color sequencing, four-color sequencing and
4 combinations thereof.

1 59. (New) The method according to claim 55, wherein said polymerase is
2 immobilized in single molecule configuration.

CI 1 60. (New) The method according to claim 55, wherein said plurality of

CD4 phosphate detectable moieties are separated from said plurality of intact NP probes.
